REMARKS

The Examiner has rejected claims 59, 61 and 69-71 under 35 U.S.C. 112, second paragraph. Applicants have amended claims 59, 61, 69 and 70 to expedite prosecution. Regarding claims 69 and 70, the Examiner is respectfully referred to, for example, Figs. 23 and 35, which illustrate joints providing four degrees of freedom. For example, in Fig. 23, sliding along axis E (arrow 307) provides the claimed degree of freedom along the drive arm axis, and in Fig. 35, sliding along axis M provides the claimed degree of freedom along the drive arm axis.

Therefore, applicants submit that claims 69-71 are in condition for allowance.

The Examiner has rejected independent claims 45 and 72 over Kitaguchi in view of Lind, and independent claims 72 and 75 over Kitaguchi in view of Almen. The Examiner's rejection states "It would have been obvious to one of ordinary skill in the art to substitute the joint of Lind for any joint in Kitaguchi for efficiently transferring forces," and "It would have been obvious to one of ordinary skill in the art to substitute the joint of Almen for any in Kitaguchi for efficiently transferring forces."

Applicants disagree. The joints of Lind and Almen were described in patents issued in the 1920's. Seventy years later, Kitaguchi did not choose to employ the joint of Lind or Almen in any of the embodiments disclosed in Kitaguchi. Furthermore, there is no teaching or suggestion in any of the references that would have led one skilled in the art to conclude that substituting the joint of Lind or Almen for the joint in Kitaguchi would improve the efficiency of the force transfer in Kitaguchi. In addition, Kitaguchi describes a different mechanism for transforming linear and rotary motions than do Lind and Almen - Kitaguchi employs a rocking motion, whereas Lind and Almen employ a wobble motion. The relationship between the degrees of freedom and relative motions encountered in the different mechanisms is not described in the references. In fact, neither Lind nor Almen describe or suggest the use of their joints with "a transition arm" coupled to a stationary support. In particular, there is no description or suggestion in Lind or Almen to employ a joint of a wobble plate mechanism to the mechanism of Kitaguchi.

The Examiner is applying impermissible hindsight using Applicant's claims as a blueprint to reconstruct the invention from the prior art. As discussed in *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991):

> It is impermissible...to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps... The references themselves must provide some teaching whereby the applicant's combination would have been obvious. (emphasis added)

Furthermore, the Examiner's rejection states: "Kitaguchi shows in figure 5 a transition arm 3 supported on a stationary support via universal joint 4." Contrary to the Examiner's assertion, Fig. 5 of Kitaguchi shows a spherical bearing 4: "spherical bearing 4 shown in FIGS. 1, 5 and 6" (see, for example, col. 6, lines 14 and 15 of Kitaguchi). Kitaguchi states that the embodiment of Fig. 4 utilizes a "cross-type universal bearing" (see, for example, col. 6, lines 1-7 and col. 8, lines 18-19 of Kitaguchi). Kitaguchi further states that the embodiment of Fig. 4 is applicable for use with the cylinder arrangements of Figs. 3A and 3B, in which only two-dimensional motion occurs, and thus only two degrees of freedom are provided at the joint between the piston and shaft 12 (see, for example, col. 8, lines 18-27). Therefore, with respect particularly to dependent claims 46, 73 and 76, which each recite a universal joint, there is no suggestion or motivation in the references to provide the piston joints of Lind or Almen for use with the mechanism of Fig. 4 of Kitaguchi, because the piston joints of Lind and Almen provide a greater number of degrees of freedom than are employed in the mechanism of Fig. 4 of Kitaguchi.

The Examiner has rejected dependent claim 51 over Kitaguchi in view of Lind and Whatley. Whatley does not overcome the deficiencies in Kitaguchi and Lind discussed above. Whatley, again a reference from the 1920s, does not provide a suggestion or motivation for modifying the joint of Kitaguchi.

Therefore, applicants submit that claims 45, 72 and 75, and there dependent claims, are patentable over the cited art.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be allowed. Enclosed is a check for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the claims:

Claims 45, 59, 61, 69, 70 and 72 have been amended as follows:

45. (Amended) A piston assembly, comprising:

a double ended member having first and second elements configured for linear motion along a common axis, at least one of the first and second elements being a piston,

a transition arm coupled to a stationary support, the transition arm including a drive arm coupled to the double ended member by a joint positioned between the first and second elements, the joint including

an outer member configured for movement relative to the first and second elements, the outer member defining [a] an opening for receiving the drive arm, and

an inner member mounted within the outer member for movement relative to the outer member, the inner member defining an opening for receiving the drive arm.

59. (Amended) The piston assembly of claim 45 wherein the drive arm defines a longitudinal axis, the joint further comprising a mount for [holding] limiting movement of the drive arm [axially stationary] along the longitudinal axis while permitting the drive arm to rotate about its longitudinal axis.

61. (Amended) The piston assembly of claim 45 wherein the opening in the inner member comprises a channel [defining a channel axis perpendicular to the second axis].

69. (Amended) A piston assembly, comprising:

a plurality of double ended members, each double ended member having first and second elements configured for linear motion along a common axis, at least one of the first and second elements being a piston,

a transition arm coupled to each of the double ended members, the transition arm including a plurality of drive arms, each drive arm defining a drive arm axis,

a plurality of joints, each joint for coupling one of the plurality of drive arms to a respective one of the double ended members, each joint providing degrees of freedom in four directions between the transition arm and the respective double ended [piston] member, the four

degrees of freedom being [rotation] a) about the drive arm axis, [sliding] b) along the drive arm axis, [pivoting] c) about an axis perpendicular to the drive arm axis, and [sliding] d) in the direction of the perpendicular axis, and

a universal joint connecting the transition arm to a support.

70. (Amended) A piston assembly, comprising:

a plurality of double ended members, each double ended member having first and second elements configured for linear motion along a common axis, at least one of the first and second elements being a piston,

a transition arm coupled to a stationary support, the transition arm including a plurality of drive arms, each drive arm defining a drive arm axis, and

a plurality of joints, each joint for coupling one of the plurality of drive arms to a respective one of the double ended members, each joint providing degrees of freedom in four directions between the transition arm and the respective double ended piston, the four degrees of freedom being [rotation] a) about the drive arm axis, [sliding] b) along the drive arm axis, [pivoting] c) about an axis perpendicular to the drive arm axis, and [sliding] d) in the direction of the perpendicular axis.

72. (Amended) A piston assembly, comprising:

a plurality of double ended members, each double ended member having first and second elements configured for linear motion along a common axis, at least one of the first and second elements being a piston,

a transition arm coupled to a stationary support, the transition arm including a plurality of drive arms, each drive arm defining a drive arm axis, and

a plurality of joints, each joint for coupling one of the plurality of drive arms to a respective one of the double ended members, each joint providing rotation about the drive arm axis, and sliding in the direction of at least one of first and second orthogonal axes perpendicular to the [drive arm] common axis.

New claims 77-82 have been added.